

Things to Know, Understand and Do For Chapter 5: Gases

By the end of Chapter 5, you should be able to:

Describe how pressure measurements are made and work with and convert between units of pressure: atmospheres (atm), torr (torr), millimeters of mercury (mm Hg), kiloPascals (kPa).
Understand the origins of and basis for the gas laws (Avogadro's, Boyle's, Charles') and know how to use those laws. Also, how these laws can be grouped to create the combined gas law .
Know what conditions are called "standard temperature and pressure, STP" for a gas.
Understand the origin of the ideal gas law and know how to use the equation.
Calculate the molar mass of a gas, given the pressure, the volume and the temperature of a known mass of gas.
Stoichiometric calculations involving gases.
Use Dalton's Law of Partial Pressures
Understand kinetic-molecular theory of gases, especially distributions of molecular speeds.
State, discuss and understand the tenets of the kinetic-molecular theory of gas behavior at the molecular level. Explain the relationships between T, P, V and n using the kinetic-molecular theory of gases.
Understand the phenomena of diffusion and effusion and know how to use Graham's Law
Appreciate that gases often do not behave as ideal gases, understand what happens at the molecular level (violations of the kinetic-molecular theory of gases) that results in non-ideal gas behavior. Know that these deviations occur under conditions of high pressures and low temperatures.
Use the van der Waal's equation to in calculations for gases at non-ideal conditions and know properties of gas molecules that impact the a and b terms.

I would also read Section 5.10 on chemistry in the atmosphere.

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